
XV. *A Botanical History of the Genus Tofieldia.* By Sir James Edward Smith, M.D. F.R.S. P.L.S.

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NOTWITHSTANDING the assiduous labours of so many acute and learned men in the field of Botany for three centuries past, much still remains to be done in the mere determination of species. All our care and watchfulness are still requisite, to keep the science clear of confusion, even in the history and discrimination of European plants. No accurate and scientific student will find any want of employment, or of well-deserved credit, in the exclusive cultivation of this field. The more familiar the plants, the less carefully have they, often, been studied, and the more numerous their synonyms, the greater is the chance of accumulated and intricate mistakes. Those who are competent to devote themselves to this branch of scientific inquiry, will wisely avoid all loss of time about matters of opinion, concerning which, men more learned and experienced than themselves have differed, but which are in general sufficiently settled for all practical uses, though they might be debated upon for ever, without any incontrovertible conclusion. Such are many of the genera in dispute between Linnæus and other authors; in alluding to which, I by no means wish to deter young botanists from the study of genera, one of the most instructive that they can pursue. But to learn and to teach are very different things. I cannot too often protest against those more tempting roads to immortality, gratuitous

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changes

changes of names, and speculations in classification. The former can only be permitted, if at all, to the most eminent leaders and reformers of botanical science, who may be capable of acquiring supreme authority in the latter.

The writer of this paper has never thought himself more directly pursuing the best objects of that Society, now so eminent, and so extensively useful, to whose service he has so long been devoted, than when employed in those practical investigations and criticisms, by which its "Transactions" are particularly distinguished. These subjects are so far from being exhausted, that scarcely any considerable genus of plants could be taken at random out of the Linnæan herbarium, without affording matter for an ample dissertation.

The genus *Tofieldia* is known to have been involved in much confusion, as to its name and character; but no one seems aware of the still greater confusion, and intricate misapprehensions, which concern its species. I shall attempt to unravel both these subjects.

The late Mr. Dryander has well pointed out, in the second edition of Mr. Aiton's *Hort. Kew.* v. ii. 324, that our present *Tofieldia* was the real and original *Anthericum* of Linnæus, in his *Genera Plantarum*, ed. i. 106. Accordingly it there stands in the *Hexandria Trigynia*. But in the second edition of the same work, published five years afterwards, the author combines, or rather confounds, with this genus his own *Bulbine*, *Gen. Pl.* ed. i. 95, as Tournefort had done before him. In the first edition of the *Species Plantarum* therefore *Anthericum* is a most heterogeneous assemblage; and so it continued in all the subsequent publications of the great Swedish botanist. Some things have been done in England still further to embroil, and some to reform it. The *Hortus Kewensis*, and Mr. Brown's *Prodromus*, stand eminently

nently conspicuous among the works which have conduced to the latter object. Their authors have, in this instance, wisely exercised that discretionary paramount authority, which belongs only to the leaders in Botany, of overruling a prior claim of nomenclature. Instead of setting up the original *Anthericum*, they have retained that name for the numerous species to which it is popularly applied, and which make the bulk of the genus as Linnæus and his followers have subsequently understood it. Hence a very troublesome degree of perplexity is avoided; especially as these writers must otherwise either have invented a new name, or have restored *Bulbine*, already differently applied by Gærtner. They certainly knew better than to take up with Tournefort's *Phalangium*, which is appropriated to a genus of insects.

The author of the *Flora Britannica* indeed, aware of the above-mentioned confusion and pretensions respecting *Anthericum*, had exercised the same discretionary power, following Mr. Hudson in his name of *Tofieldia*. Under this is commemorated Mr. Tofield, a country gentleman in the neighbourhood of Doncaster, who there discovered the *Vicia bithynica*, a plant which had escaped the notice of Ray and the botanists of his time, though since observed in other parts of England. The herbarium of Mr. Tofield came, in 1793, after his decease, into the possession of Dr. Younge of Sheffield, F.L.S.

Jussieu, led by Gerard, has transferred Mœring's name of *Narthecium* to our *Tofieldia*; from an idea, as it appears, that the real *Narthecium* of that author belonged to this genus, though nothing can be more distinct. We believe it to be no less distinct from *Anthericum*, though retained in that genus, after Willdenow, in the *Hortus Kewensis*. The able M. Decandolle, not wishing perhaps to clash with Jussieu, has called this last
plant

plant *Abama*; but the prior right of *Nartheecium*, published in 1742, is irrefragable.

The genus whose illustration is the object of the present disquisition, may therefore be considered as now established beyond the reach of controversy, under the following name and characters.

T O F I E L D I A .

Huds. Fl. Angl. 157. *Sm. Fl. Brit.* 397. *Dryand. in Ait. Hort. Kew.* v. ii. 324. *Pursh Amer. Sept.* 216. *Decaud. Fr.* v. iii. 193.

Anthericum. *Linn. Gen. Pl. ed. i.* 106. *Hall. Hist.* v. ii. 93.

Nartheecium. *Ger. Gallopr.* 142. *Juss. Gen.* 47. *Lamarck Illustr.* t. 268.

Isidrogalvia. *Ruiz et Pavon Peruv.* v. iii. 69. *Dryand.*

CHAR. Ess. *Calyx* trifidus. *Petala* sex, æqualia. *Styli* verticales, breves. *Capsulæ* tres, superæ, basi junctæ, polyspermæ. *Antheræ* subrotundæ.

C H A R . N A T .

Cal. Perianthium inferum, remotiusculum, monophyllum, membranaceum, trifidum, parvum, persistens.

Cor. *Petala* sex, oblonga, concava, æqualia, patentia, persistentia, calyce multoties longiora.

Stam. Filamenta sex, petalis opposita, subulata, simplicia, glabra, longitudine corollæ. *Antheræ* incumbentes, cordato-subrotundæ.

Pist. Germina tria, supera, conniventia, acuminata, desinentia in stylos brevissimos, verticales, distantes. Stigmata capitata.

Peric. *Capsulæ* tres, basi connexæ, gibbosæ, carinatae, membranaceæ, uniloculares, bivalves, intus præcipuè dehiscentes.

Sem. Numerosa, elliptico-oblonga, angulata, valvularum margini internæ utrinque inserta.

Nartheecium,

Narthecium, which agrees most in habit with the genus before us, is distinguished from it by the want of a calyx; as well as by having a simple germen and single style; hairy filaments; and a membranous tunic, tapering at each end, to the seeds. *Anthericum*, including the *Phalangium* of Tournefort and Jussieu, differs from *Tofieldia* in having no calyx; a simple germen and style; and angular seeds. *Helonias*, to which Willdenow refers our *T. palustris*, confounding under that solitary species nearly the whole genus, has a simple germen and capsule, though three styles; very few seeds in each cell; and wants the calyx.

The species of *Tofieldia* have hitherto been even less understood than its generic characters, as the following exposition will show.

1. *T. palustris*, capitulo ovato, caule glabro filiformi aphylo, petalis obovatis obtusis, germinibus subrotundis.
T. palustris. *Huds. Angl.* 157. *Sm. Brit.* 397. *Engl. Bot.* t. 536. *Ait. Hort. Kew.* v. ii. 324.
T. pusilla. *Pursh Amer. Sept.* 246.
Anthericum calyculatum. *Linn. Sp. Pl.* 447. *Fl. Lapp. ed. ii.* 106. t. 10. f. 3. *Fl. Dan.* t. 36. *Lightf. Scot.* 181. t. 8. f. 2.
Helonias borealis. *Willd. Sp. Pl.* v. ii. 274.
Narthecium pusillum. *Michaux Boreali-Amer.* v. i. 209.
Phalangium scoticum palustre minimum, iridis folio. *Raii Syn.* 375. *Tourn. Inst.* 369.

Native of the black boggy margins of pools and trickling rills, on the mountains of Lapland, Scotland, Durham, and North America, particularly lake Mistassins, flowering from June to August.

This is a perennial herbaceous plant, of humble stature, entirely smooth in every part. The *root* is horizontal and somewhat tuberous, or woody, but slender, with very long, tough, white, zigzag

zag fibres. *Leaves* composing numerous radical tufts, dark green, equitant, sword-shaped, ribbed, two inches long. *Stem* erect, from four to six inches high, solitary, simple, round, quite smooth, naked; triangular at the base, where it often bears one small leaf, not rising above the others. *Flowers* pale green, very small, in a little oblong, obtuse, generally very dense head, from a quarter to half an inch in length. The partial *flower-stalks* are entirely wanting, the *calyx* being crowded close to the main stalk, with hardly any perceptible *bractea*. The base of the flower within the calyx is however elongated, assuming, as the fruit advances, the appearance of a thick stalk, swelling upwards, half a line in length. *Calyx* very deeply divided into three acute segments, small, membranous, and whitish. *Petals* hardly a line long, obovate, generally quite obtuse, concave, greenish-white, longer than the stamens. *Germens* combined into a nearly globular form, with three furrows. *Styles* extremely short, spreading, with abrupt, slightly capitate, stigmas. *Capsules* converging, roundish-obovate, each about the size of mustard-seed, obtuse, with a minute spreading point crowned by the *style*.

Such is the original Lapland plant of Linnæus, exactly agreeing with specimens from Scotland and the county of Durham, as represented in *Engl. Bot.*, and answering precisely to the *T. pusilla*, adopted by Pursh from Michaux. With this has all along been confounded a Swiss species, which we are next to describe, and which is the only plant known to botanists of the South of Europe as the Linnæan *Anthericum calyculatum*. Dillenius caused this confusion, as appears by the *Flora Lapponica*; where Linnæus, who strongly suspected these two plants to be different, but never, to the day of his death, saw more than one of them, was induced by his learned correspondent to consider them as varieties of each other.

2. *T. alpina*, racemo cylindræco, bracteis pedunculo subæqualibus, caule glabro diphylo, petalis obovatis, germinibus oblongis.
- T. palustris*. *Decand. Fr.* v. iii. 193. *Redout. Liliac. t.* 256. Anthericum n. 1205. *Hall. Hist.* v. ii. 98; excluding the synonyms of Mœring and Gorter.
- A. Pseudoasphodelus*. *Jacq. Enum.* 59, 233.
- Narthecium iridifolium*. *Villars Dauph.* v. ii. 225.
- N. calyculatum*. *Allion. Pedem.* v. ii. 165. *Lamarek Franc.* v. iii. 298.
- Scheuchzeria Pseudo-asphodelus*. *Scop. Carn.* v. i. 263.
- Phalangium alpinum palustre*, iridis folio. *Tourn. Inst.* 368. *Segu. Veron.* v. ii. 61. t. 14. *Scheuchz. It.* v. i. 139.
- Pseudo-asphodelus alpinus*. *Bauh. Pin.* 29.
- Pseudo-asph. pumilus*, foliis iridis. *Clus. Pan.* 261. t. 262.
- Pseudo-asph. secundus*. *Clus. Hist.* v. i. 198.
- Pseudo-asph. quibusdam*. *Bauh. Hist.* v. ii. 634; the description, not the figure, which represents a *Panocratium*.
- Asphodelus Lancastræ verus*. *Ger. Em.* 96.

Very common in moist grassy pastures on the alps of Europe, throughout Austria, Switzerland, the south of France, and north of Italy, flowering in August. Scheuchzer says it grows on the shady dry ridges of hills, and he therefore wonders at Tournefort's epithet of *palustris*. I have gathered this plant in the boggy margins of alpine rivulets, on the plain of mount Cenis. Seguiet, Villars, and Allioni speak of it as an inhabitant of rich, moist, or spongy soils, among grass. Notwithstanding what is said in Gerarde's Herbal, there is no authority for its ever having been found in Britain.

This species is, in every part, twice the size of the foregoing, of which it has, till now, been considered as a variety, whose greater luxuriance, or more dilated habit, was attributed to its situation in a more favourable climate. Into this error I have been led in the *Flora Britannica*, where therefore a number of erroneous synonyms are accumulated; but the description belongs precisely to the *T. palustris*, except perhaps what regards the *bracteas* and *fruit*. So much are we frequently disposed to see with the eyes of others, that it was not before I had compared the figure in *English Botany* with that of Redouté, both cited together in *Hort. Kew.*, that I was obliged to correct my opinion. After making all imaginable allowance for possible inaccuracy in the two artists, however excellent; and for the one plate being taken from a wild specimen, the other from a most luxuriant garden plant; nothing seemed to justify a conclusion of their belonging to one species. A more close examination of the plants themselves immediately removed all uncertainty. Besides the difference of size, as above mentioned, the *root* of what I have now named *T. alpina* is much thicker in proportion, and more woody. The *stem* bears two distant *leaves*, of which the uppermost especially is much smaller than the radical ones, and if situated more than half way up the stem, it diminishes in proportion. But the most satisfactory differences exist in the *flowers*. The *inflorescence* is a *cluster (racemus)*, from one to two inches long, frequently interrupted or scattered. The *partial stalks*, though short and thick, are always distinctly present, having a concave permanent solitary *bractea*, about their own length, at the base; and as the *fruit* advances they become more evident, a line or more in length, and curved upward. The *calyx* is close to the rest of the flower, cup-shaped, unequally and rather slightly
three-



Juncus stenopetalus.

J. glutinosus.

three-cleft. *Petals* rather more yellowish, scarcely so long as the stamens. They are represented too narrow and acute in M. Redouté's figure. *Capsules* combined almost all the way up, making together a roundish-elliptical three-lobed figure, larger than a coriander seed, of a light brown, transversely corrugated, their points widely spreading, crowned with the short thick *styles*, and capitate *stigmas*. The *seeds* are extremely numerous. The wooden cut of the old authors above cited, is quite as expressive as the copper-plate of Seguier, commended by Villars, and copied by Lamarck.

3. *T. stenopetala*, racemo cylindraceo, bracteis calycem superantibus, caule glabro diphylo, petalis lanceolatis acutis.

Gathered by Kalm in North America, but in what part we are unable to determine. Three of his specimens are preserved in the Linnæan herbarium.

This, which Linnæus did not distinguish from his *Anthericum calyculatum*, is most akin to our *Tofieldia alpina*, with which it accords in size and habit, as well as in bearing two, sometimes three, alternate distant *leaves* on the *stem*. The *inflorescence* is a dense obtuse *cluster*, one inch and a half long, interrupted in the lower part. The *bracteas* however afford a clear specific difference, being lanceolate, and extending not only to the summit of the short and thick partial flower-stalks, but often reaching much beyond the *calyx*, which latter is very broad and shallow, unequally three-cleft, sometimes with a few supernumerary teeth or notches. The *petals* are very different in shape from both the preceding species, being lanceolate and acute. Their colour seems a greenish white. *Anthers* pointed. *Germens* ovato-lanceolate. *Styles* twice as long as the last.

TAB. VIII. Fig. 1 represents a dried specimen of *T. stenopetala*, of the natural size, with the separate parts of fructification magnified.

nified. A is the *calyx* with its *flower-stalk* and *bractea*. B, a *petal*. C, *Stamen*. D, *Germens* and *styles*.

4. *T. cernua*, racemo cylindræo, floribus cernuis, bracteis brevissimis, pedunculis glabris longitudine corollæ, caule aphylo. Anthericum filamentis lævibus, perianthio integerrimo. *Gmelin Mss.*

A. n. 39. *Gmelin Sibir.* v. i. 73. t. 18. f. 2; the synonyms altogether erroneous.

Native of mountainous woods, near the river Lena, in Siberia, flowering about the end of July. Specimens in flower and fruit, sent by Gmelin, are preserved in the Linnæan herbarium; and we find with astonishment that when the first edition of the *Species Plantarum* was written, they were confounded with the genuine Lapland *Anthericum calyculatum*, even by Linnæus himself.

The present most distinct species is as different from *T. palustris* as two plants of one natural genus can well be. It is more akin to our second and third species, with which it accords in general aspect, but the *roots* are of a more creeping nature, and the *stem* is taller, a foot or more in height, quite leafless, except at the very base, cylindrical throughout, glaucous in the upper part. *Leaves* narrow, near three inches long, with a small oblique point; their edges rough toward the extremity. *Cluster* erect, many-flowered, from two to four inches in length, rather lax, but scarcely interrupted. *Partial flower-stalks* nearly horizontal, slender, angular when dry, quite smooth, about one eighth of an inch long, and as the fruit advances becoming still longer. *Bracteas* solitary at the base of each stalk, and about a quarter as long, ovate, keeled, a little recurved. *Flowers* white, drooping, about twice the size of *Convallaria bifolia*. *Calyx* dilated, with three shallow,

shallow, obtuse segments. *Petals* obovate, obtuse, slightly pointed, concave, the length of the flower-stalks, and keeping pace with them in their subsequent elongation, when the petals become very narrow at the base. *Stamens* shorter than the corolla; the *anthers*, according to Gmelin, yellow. *Germens* and *styles* much like *T. stenopetala*. *Capsules* quite pendulous, shorter than the permanent corolla, obovate, very thin and brittle, combined nearly all the way up, but easily separated, each crowned with a straight spreading *style*, and capitate *stigma*. *Seeds* very numerous, small, slender, prismatic.

Gmelin mentions, on the authority of Steller, a variety with leaves upon the stem, which we should suspect to be a different species; but without seeing specimens, we can determine nothing respecting this point.

5. *T. pubens*, racemo cylindraceo interrupto, pedunculis fasciculatis scabris longitudine corollæ.

T. pubens. Dryand. in Ait. Hort. Kew. v. ii. 325.

T. pubescens. Pursh Amer. Sept. 246.

Nartheceium pubens. Michaux Boreali-Amer. v. i. 209.

Melanthium racemosum. Walt. Carol. 126.

Anthericum filamentis lævibus, perianthio trifido. Linn. Hort. Cliff. 140. Gron. Virg. ed. i. 39.

l. foliis ensiformibus, perianthiis trilobis, filamentis glabris. Gron. Virg. ed. ii. 51.

Asphodelus minor albus. Pluk. Mant. 29. Phyt. t. 342. f. 3.

Native of moist meadows, swamps, and mossy boggy woods, in Virginia and Carolina, flowering in July. Clayton, Pursh.

Having no specimen of this, I postpone its description, till I can examine the Banksian herbarium. It makes the last of five species, which have been confounded together under the Linnæan *Anthericum calyculatum*.

6. *T. glu-*